Farm Structure and Socioeconomic Conditions in the South

by

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Introduction

Much of the social science literature on agricultural structure has characterized the farm sector as undergoing an uneven process of development. Researchers have noted the dualistic tendency toward a growing number of smaller farms and toward an increase in the proportion of agricultural sales by larger farms (See Stockdale, 1982). While changes in the structure of farming have been well-documented, comparatively few studies have examined the effects of various farm structures on the socioeconomic conditions of individuals and their communities. This issue is particularly important in the context of Southern agriculture. According to Skees and Swanson (1985:4), the South has experienced more rapid farm change in recent years than other U.S. regions. Declines in farm numbers and in full-owner operations and increases in dependence on off-farm work and hired labor have occurred at a faster rate in the South. Moreover, the South has historically experienced the lowest socioeconomic conditions, such as greater poverty and lower family income (Skees and Swanson, 1985; Seninger and Sneeding, 1981; Morrill and Wohlenberg, 1971). In this regional context, it becomes critical to examine how the development of the farm sector has shaped socioeconomic conditions and to delineate the farm structures that can improve conditions. The purpose of this study is to address these issues by examining the effects of various farm structures on socioeconomic conditions in the South.

Farm Structure and Socioeconomic Conditions

The work of Walter Goldschmidt has been a starting point for studies which have examined the socioeconomic impacts of farming. In 1944, Goldschmidt (1968, 1978a) performed a case-study of two rural communities in the San Joaquin Valley, one dominated by large, industrial-like farms, the other by family farming. Goldschmidt found higher socioeconomic conditions in the family farming community, which he attributed to farm scale. Since the seminal work of Goldschmidt, a number of studies have examined the relationship between farm structure and socioeconomic well-being. Following Goldschmidt, most studies hypothesize that large-scale, industrial farming, dependent upon

hired labor will have a detrimental impact on socioeconomic conditions; smaller scale, by contrast, will enhance community life. The studies examine the impact of indicators of one or both farm concepts -- farm scale and organizational characteristics. Socioeconomic impacts examined have included: population, class structure, levels of income and living, quantity and quality of community services, political and community social participation, unemployment, retail sales, and environmental concerns.

Much research, particularly before the early 1980s, tended to support the Goldschmidt hypotheses (See Rodefeld, 1974; Tetreau, 1940; Goldschmidt, 1978b; Swanson, 1980; Fujimoto, 1977; Raup, 1973; Heffernan, 1972; Martinson et al., 1976). More recent findings, however, have been mixed (See Harris and Gilbert, 1982; Skees and Swanson, 1985; Swanson, 1982; Eberts, 1979; Green, 1985; Heady and Sonka, 1974; Marousek, 1979).

There are a number of reasons for these recent divergences. Later studies have more thoroughly controlled for nonfarm factors, such as urbanization and nonfarm employment. As economic development proceeds, these nonfarm factors can be expected to be more important determinants of socioeconomic conditions than farming itself (Wheelock, 1979; Swanson, 1982). The Office of Technology Assessment (OTA) also reports that unionization of farm labor, social welfare programs, and labor laws favorable to hired workers, which have increased from prior decades, can reduce the negative impacts of industrial farming (Skees and Swanson, 1985). Another issue centers on the types of relationships examined in most studies in the Goldschmidt tradition. Few studies have been longitudinal or able to examine impacts over time. Further, according to Skees and Swanson (1985), previous studies have possibly misspecified the relationship between farm scale and well-being by examining only linear, rather than curvilinear relationships. Skees and Swanson's (1985) argument is supported by their finding that Southern counties with either smaller or very large average farm scales were more likely to have higher levels of unemployment. In sum, previous literature on farming structure suggests the need for more thorough control of nonfarm factors, for longitudinal

studies, and for extending the examination of farm structure beyond the family/industrial farming dichotomy.

A general hypothesis of this study is that industrial-like, corporate farming dependent upon hired labor will lead to lower socioeconomic conditions, while family units (both smaller and larger family farming) should have the converse effect. Although recent studies have questioned these relationships, testing such hypotheses can contribute to the Goldschmidt debate.

Data and Methods

To test the hypotheses, the study employs county level data from major secondary sources, such as the Census of Agriculture and Census of Population. The study covers two time points, 1970 and 1980, for which comparable data were available. Because the study has a major focus on farming, all counties having farming reported by the Census of Agriculture were selected for inclusion. The Censuses which most closely correspond to the time periods were conducted in 1969 and in 1978. A total of 1378 counties in the states comprising the U.S. Census Southern region were analyzed.

Farm Structure

To operationalize farm structure, measures which reflect structural change or differentiation were needed. These measures also had to have the county as a geographical referent and had to be comparable over time. Using factor analysis, Wimberley (1983, 1984, 1985) has developed indexes of county farm structure constructed from items reflecting differentiation in organization, scale, and operator/household characteristics. Each index is composed of several items from the Census of Agriculture. The indexes measure three major patterns or dimensions of farm structure found in U.S. counties. Wimberley's work forms the empirical basis for measuring farm structure in this study. Factor analysis on the same Census items as utilized by Wimberley is performed for the Southern states only. As in Wimberley's national studies, three farming patterns (or factors) emerge and the same variables tend to load highly on the same factors. The three indexes of Southern farming patterns are described below.

I. Corporate/Commercial Farming

This pattern reflects a county farm structure organized along corporate lines. Farm labor requirements, as indicated by expenses for contract labor are high. The pattern reflects characteristics in the literature attributed to industrial, large-scale capitalist farming. Items used in constructing the index for corporate/commercial farming are: the number of corporate farms in the county and expenses for contract labor. Cronbach's alpha coefficient for the internal consistency of the index is .874 and .867 for 1969 and 1978, respectively.

II. Larger Family Farming

This farming reflects an organizational pattern of tenant operations. It characterizes those counties with much of their land in farming. Larger family farming tends to be very capital rather than labor intensive, with high investment in farm machinery and equipment. Thus, while not traditional family farming (as defined by operator control and ownership over major production factors), this farming pattern encompasses certain characteristics of family farming such as use of little hired labor. It describes those simple commodity producers who are not marginalized in the course of development, but rather who become increasingly market oriented in the attempt to stay in farming. Items comprising the index for large family framing are: the proportion of a county's land in farming; number of farms operated by tenants; the estimated market value of farm machinery and equipment. Cronbach's alpha coefficient for the index is .780 and .825 for 1969 and 1978, respectively.

III. Smaller Family Farming

This describes a pattern of county farming with many small farms or those having less than $2500 in annual sales, operated entirely by owners who reside on the farm. This farming pattern is also characterized by many part-time operators who work off-farm for most of the year (200 or more days). It reflects the differentiation of family labor producers into marginalized farmers via off-farm labor opportunities. Items used in constructing the index for smaller family farming are: the

total number of farms in a county; the number of small farms, with sales less than $2,500; the number of full-owner operated farms; farm residency; the number of operators working 200 or more days off-farm. Cronbach's alpha coefficient for the index is .982 and .981 for 1969 and 1978, respectively.

In order to create the farm pattern indexes, each variable was standardized to a mean of 50, standard deviation of 10. Because the variables were all in different metrics, this allowed them to be equally weighed. Each index was then standardized to a mean of 50 and standard deviation of 10. Use of these patterns permits this study to go beyond the conventional examination of single-indicator, linear relationships and conceptually dichotomous farm types which have characterized previous tests of the Goldschmidt hypothesis.

Socioeconomic Conditions

Measures of economic well-being, which should most directly reflect the costs and benefits of these sectors, are employed as indicators of socioeconomic conditions. Measures of economic well-being "serve as indicators of class structure, life chances, life style, and are essential factors in community quality of life." (Rogers et al., 1978: 252). Three indicators were selected: the median family income of the county, the percent of county families in poverty (a measure of absolute deprivation by Census definition), and the Gini coefficient for family income inequality. Poverty and median family income are reported directly in the Census of Population, while the Gini coefficient was developed from Census income categories.

Control Variables

The quality of industrial structure present in an area can potentially affect socioeconomic conditions. We control for industry quality, following economic segmentation theory, by classifying county labor force employment into core (e.g., durable manufacturing, finance, etc.), peripheral (e.g., nondurable manufacturing, retail trade, etc.), and state (e.g., health education, welfare, etc.) categories. The literature indicates that core and state sector employment should lead to higher socioeconomic conditions (Hodson, 1978, 1983; Averitt, 1968; Baron and Bellby, 1980). We draw largely upon Hodson's (1978, 1983) work for classifying industries as core, peripheral or state.

Several other control variables are employed. These are: the percent urbanized, percent black population, the unemployment rate, the mean size of county business establishments, the percent farm to rural population, and adjacency to metropolitan areas. This latter variable is measured by a three point index which assigns a value of 0 to metropolitan counties, 1 to nonmetropolitan adjacent counties, and 2 to nonmetropolitan, nonadjacent counties.

The Analysis

Cross-sectional and longitudinal analyses of data are performed in this study. Results from the cross-sectional analyses for each of the study years 1970 and 1980 are first presented. Then, the longitudinal analysis is presented. This involves testing variables measured at the 1970 time point, for their effects on 1980 socioeconomic conditions. Ordinary least squares (OLS) multiple regression analysis is used to test the hypotheses. There was no evidence of extensive autocorrelation in the longitudinal model and hence, we are reasonably certain that our results are efficient and can therefore be used to draw meaningful conclusions.

The Effects of Farm Structure on Median Family Income

The impact of farm structure on median family income is presented in Table 1. For 1970, the model explains 64 percent of the variance in income, indicating reasonable predictive accuracy. Counties with a greater extent of larger family farming have significantly higher (beta = .222) median family income as predicted. Contrary to the hypotheses, counties with a greater extent of smaller family farming have significantly lower (beta = -.192) income. Finally, corporate farming has no significant impact, although the beta is in the predicted negative direction. Most of the control variables have significant impacts on income, which are generally consistent with previous research. Counties with higher core and state employment, less unemployment, larger business establishments, lower farm populations, higher urbanized populations, and more closely located to metropolitan areas have higher median family income. Counties with higher black populations have significantly lower incomes, indicating that discrimination and unequal opportunities may still inhibit the advancement of blacks.

The aforementioned relationships remain similar for 1980. In this model, the negative impact of corporate farming has become significant, while smaller family and larger family farming maintain their respective negative and positive relationships.

The longitudinal analysis indicates the strength of the effect that the 1970 independent variables have on the dependent variable in 1980. The explained variance of this model is 81 percent, indicating that the county's prior history with respect to median income, coupled with the effects of the independent variables largely explains the income of Southern counties in 1980. Counties with a greater extent of larger family farming in 1970 had significantly higher income in 1980, while counties with more smaller and corporate farming had no significant improvements. Particularly in the later case, counties experienced slight declines in income over this period. The control variables have somewhat different pattern of relationships, once the prior effects of median family income are controlled. This is expected, because median family income has a low relationship with all of these variables. Important shifts in Southern industrial structure are reflected in the model. Counties with greater peripheral employment, higher urban populations, and larger business establishments had significant reductions in median family income during the decade.

The Effects of Farm Structure on Family Poverty

The findings of farm impacts on poverty are presented in Table 2. Each of the cross-sectional models explains over 60 percent of the variance in family poverty. In 1970, counties with a greater extent of larger family farming have significantly lower poverty, while counties with a greater extent to smaller family farming have significantly more poverty. Corporate farming has little relationship with poverty. In 1980, only smaller family farming is significantly related to poverty, with generally negligible effects of corporate and larger family farming. The longitudinal model explains almost 82 percent of the variance in poverty. Once the prior effects of poverty have been controlled, county farm structures have no significant impacts on future 1980 poverty.

The control variables generally indicate relationships consistent with the analysis of median family income. Unemployment and high black population are particularly strong predictors of poverty.

In contrast to the literature, and to the analysis of median family income, peripheral employment significantly reduces poverty in 1970 and 1980. In the longitudinal model, however, core employment has the only significant industrial impacts.

The Effects of Farm Structure on Income Inequality

Table 3 presents the analysis for income inequality. Each of the cross-sectional models explains about 50 percent of the variance, indicating somewhat less explanatory power than for the models of the previous two socioeconomic indicators. In 1970, counties with a greater extent of smaller family farming and corporate farming have significantly greater income inequality, while the opposite relationship exists for those higher on larger family farming. In 1980, the relationship for smaller family and corporate farming remain similar. Counties with a greater extent of larger family farming, however, show slight though not significantly higher income inequality. The longitudinal model explains about 65 percent of the variance in income inequality. None of the farm structures have significant relationships with income inequality. Larger family farming, however, is associated with a slight reduction in income inequality over time.

The strongest predictors of income inequality are found among the control variables. The three types of industry structure tend to be negatively related to income inequality. Counties with higher unemployment and a significant black population, which may have been subjected to limited opportunities, have particularly higher income inequality.

Discussion and Conclusion

The purpose of this paper was to examine the impacts of farm structure on socioeconomic conditions, and in doing so, to address some of the limitations of previous research. In contrast to most other studies, we have employed multiple indication measures of farm structure which have permitted the examination of three farming patterns and extended the analysis of the Goldschmidt hypothesis. We have further controlled for industrial structure and other important nonfarm factors often neglected in previous research.

Of the three farming patterns, larger family farming had the most positive impacts on socioeconomic conditions. Counties with a greater extent of this pattern had significantly higher median family income throughout the 1970-1980 period. Such counties also had lower income inequality and poverty in 1970, though for 1980, these relationships are not as apparent. Larger family farming reflects capital intensive, tenant operated farming conducted in counties with much farm land. Though this dimension of farm structure has not been examined in other studies, this finding tends to support that aspect of the Goldschmidt hypothesis regarding the positive contributions of noncorporate farms using little hired labor.

In contrast to expectations, smaller family farming tended to lower socioeconomic conditions, contributing to lower median income and higher poverty and income inequality. This farming pattern reflects a pattern of concentration of small-scale farms, which tend to be owner-operated, resident-occupied, and part-time. Little research has addressed the characteristics and impacts of farming patterns at this end of the farm size continuum. However, Skees and Swanson (1985) findings suggest that the Goldschmidt hypothesis may require reconceptualization to take into account negative impacts of the smallest farms. Finally, Tweeten (1981:140) makes a similar argument. He states that research in the Goldschmidt tradition has failed to realize that:

> . . . Dinuba was a town surrounded by family-sized farms (slightly larger than average size), not by small farms. Many towns in the South are surrounded by small, low-income farms. These communities are characterized by an egregious lack of economic and social vitality and are hardly models to be emulated. Given the importance of income and employment to well-being, the farm of optimal size from the standpoint of the community is not a small, low-income farm.

There was some support for the hypothesis that incorporated, hired-labor dependent farming would negatively impact socioeconomic well-being. Corporate farming tended to significantly reduce median economic and exacerbate income inequality, but it had little effect on poverty levels. As the OTA studies suggest, perhaps increased state intervention, such as welfare programs, improved labor laws and other nonfarm factors may have ameliorated other potential negative impacts.

In extending the findings to policy, the study indicates that of the three farming patterns, policies should be designed to support larger family farming in the South. While our analysis focuses on farming, we have examined nonfarm factors that have more important effects on socioeconomic well-being. The pervasive and enduring inequities of race and unemployment merit the greatest concern of Southern policy-makers.

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Table 1: The Effects of Farm Structure on Median Family Income

Independent Variables	Standardized Regression Coefficients: 1970 Cross-Section	1980 Cross-Section	1980 with 1970 Independent & Lagged	Unstandardized Coefficients: 1970 Cross-Section	1980 Cross-Section
Intercept	.000**	.000**	.000**	6541.34**	1868.78**
Percent in Core Employment	.118**	.126**	.032	2242.97**	5515.15**
Percent in Peripheral Employment	.042	-.032	-.062*	727.50	-1329.56
Percent in State Employment	.059*	.063*	-.001	1398.69*	3430.76*
Smaller Family Farming	-.192**	-.127**	-.010	-30.22**	-14.15**
Larger Family Farming	.222**	.122**	.099**	34.89**	39.35**
Corporate Farming	-.021	-.065*	-.051**	-3.29	-31.96*
Percent Unemployed	-.301**	-.402**	-.027*	-22747.93**	-44664.12**
Establishment Size	.255**	.153**	-.099**	122.79**	159.00**
Percent Farm to Rural Population	-.226**	-.209**	-.093**	-2815.68**	-8387.36**
Percent Urban	.230**	.183**	-.068**	1327.04**	2138.52**
Percent Black	-.260**	-.207**	.014	-2266.03**	-3816.09**
Metro Adjacency	-.256**	-.277**	-.089**	-527.38**	-1186.54**
Median Family Income 1970	N.A.	N.A.	.877**	N.A.	N.A.
R2	.643	.572	.810	.643	.572

*Significant at $p \leq .05$
**Significant at $p \leq .01$.

Table 2. The Effects of Farm Structure on Family Poverty

Independent Variables	Standardized Regression Coefficients: 1970 Cross-Section	1980 Cross-Section	1980 with 1970 Independent & Lagged	Unstandardized Coefficients: 1970 Cross-Section	1980 Cross-Section
Intercept	.000**	.000**	.000*	.320**	.190**
Percent in Core Employment	-.177**	-.229**	-.099**	-.211**	-.204**
Percent in Peripheral Employment	-.218**	-.195**	-.021	-.240**	-.162**
Percent in State Employment	-.105**	-.136**	-.008	-.159**	-.149**
Smaller Family Farming	.173**	.051*	-.028	.002**	.000*
Larger Family Farming	-.211**	.003	-.032	-.002**	.000
Corporate Farming	-.014	.003	.012	-.000	.000
Percent Unemployed	.371**	.482**	.070**	1.768**	1.087**
Establishment Size	-.135**	-.119**	.053*	-.004**	-.003**
Percent Farm to Rural Population	.110**	.100**	.113**	.086**	.081**
Percent Urban	-.145**	-.041	.086**	-.053**	-.010
Percent Black	.445**	.441**	.083**	.244**	.165**
Metro Adjacency	.186**	.161**	.017	.024**	.014**
Poverty 1970	N.A.	N.A.	.824**	N.A.	N.A.
R2	.614	.607	.818	.614	.607

*Significant at $p \leq .05$
**Significant at $p \leq .01$

Table 5. The Effects of Farm Structure on Income Inequality

Independent Variables	Standardized Regression Coefficients: 1970 Cross-Section	1980 Cross-Section	1980 with 1970 Independent & Lagged	Unstandardized Coefficients: 1970 Cross-Section	1980 Cross-Section
Intercept	.000**	.000**	.000**	.411**	.424**
Percent in Core Employment	-.224**	-.298**	-.189**	-.106**	-.132**
Percent in Peripheral Employment	-.238**	-.328**	-.162**	-.103**	-.135**
Percent in State Employment	-.034	-.134**	-.078*	-.020	-.074**
Smaller Family Farming	.125**	.052*	-.008	.000**	.000*
Larger Family Farming	-.065*	.035	-.044	-.000*	.000
Corporate Farming	.058*	.046*	.002	.000*	.000*
Percent Unemployed	.227**	.238**	.094**	.427**	.267**
Establishment Size	-.186**	-.159**	-.028	-.002**	-.002**
Percent Farm to Rural Population	.158**	.069*	.015	.049**	.028*
Percent Urban	.033	.102**	.121**	.005	.012**
Percent Black	.454**	.430**	.142**	.099**	.080**
Metro Adjacency	.177**	.220**	.097**	.009**	.010**
Income Inequality 1970	N.A.	N.A.	.589**	N.A.	N.A.
R2	.512	.507	.654	.512	.507

*Significant at $p \leq .05$.
**Significant at $p \leq .01$.

MEAN AND STANDARD DEVIATIONS FOR VARIABLES IN THE ANALYSIS

Variables	Means	Standard Deviations
Median family income 1980	15442.61	3229.10
Family poverty 1980	.155	.065
Unemployment	.066	.029
Income inequality 1980	.379	.033
Core employment 1980	.329	.074
Peripheral employment 1980	.337	.079
State employment 1980	.225	.059
Small family farming 1978	50.000	10.000
Large family farming 1978	50.000	10.000
Corporate farming 1978	50.000	10.000
Establishment size 1977	7.45	3.103
Farm to rural population 1980	.097	.080
Urban population 1980	.338	.276
Black population 1980	.169	.175
Metro adjacency 1980	1.132	.752
Family poverty 1970	.236	.099
Median family income 1970	6478.98	1573.60
Unemployment 1970	.044	.021
Income inequality 1970	.405	.039
Core employment 1970	.299	.083
Peripheral employment 1970	.369	.090
State employment 1970	.192	.065
Small family farming 1969	50.000	10.000
Large family farming 1969	50.000	10.000
Corporate farming 1969	50.000	10.000
Establishment size 1967	6.408	3.267
Farm to rural popoulation 1970	.171	.126
Urban population 1970	.319	.273
Black population	.183	.181
Metro adjacency	1.231	.763